Space Weather Forecast

Issued on Monday, 06 March 2023 at 00:33 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares (R1-R2/Minor-Moderate radio blackouts) likely. Chance of Minor Geomagnetic Storm intervals.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate over the past 24 hours, with an R2 radio blackout peaking at 05/2136UTC from a region in the northwest. There are currently ten sunspot regions on the visible disc. The largest and most magnetically complex region on the disc is in the northeast. The region which recently produced the R2 blackout has continued to develop with increasing area and some complexity. Two new regions have arrived on the east limb, both of which are currently difficult to analyse due to their proximity to the limb. Other regions are either stable or showing some minor development. There are currently no significant Earth-directed Coronal Mass Ejections (CMEs) in the forecast, although the potential for a couple of glancing blows is discussed below.

Solar Wind / Geomagnetic Activity: The solar wind has been connected to a coronal hole fast wind. Wind speeds have been at strong to elevated levels, between 500-620km/s. The Interplanetary Magnetic Field was mostly weak, with a couple of brief moderate peaks. The north-south component varied weakly but was mostly southward directed. Geomagnetic activity was Quiet to Active (Kp2-4).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to remain moderate with further Moderate-class flares, with a slight chance of rising to high with any isolated strong flares. The main flare risk is from two regions, one in the northeast and the other in the northwest, with a declining risk from a region which is now over the west limb.

Solar Wind / Geomagnetic Activity: No significant Earth-directed CMEs feature in the current forecast. However there is a low risk of glancing blows which could possibly arrive during Day 1, then during Days 2 or 3 (06 to 08 March). Otherwise, the main feature of interest is the current coronal hole fast wind which is likely to only slowly wane from later on Day 1 or more likely through Day 2 (07 Mar). A much smaller coronal hole may give a fast wind which prolongs elevated or slightly elevated wind speeds through much of this period.
Geomagnetic activity is expected to be Quiet to Active (Kp 1-4), with an ongoing risk of G1/Minor Storm (Kp5) intervals. There is a very low risk of stronger geomagnetic activity in association with any CME glancing blows.

Energetic Particles / Solar Radiation: Solar radiation levels are most likely to stay at background, but with a slight chance of reaching the S1/Minor Storm threshold or greater should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	20	10
Strong	G3	No	5	5	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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